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ABSTRACT

Problems connected with school dropouts and illiteracy are discussed. The need for decreasing recidivism and prison populations through educational programs is presented, with data on the costs of not doing so. The use of television as a teaching resource is proposed as a possible solution. A field test was conducted to determine the effects of a series of instructional television programs ("Adult Math"), designed to present mathematics concepts measured by the General Educational Development test on learners in a state correctional institution. Data were obtained for 22 persons in the experimental group and 18 persons in the control group. Two forms of the General Educational Performance Index were used as pre-and post-tests, and data were compared using analysis of covariance. The use of television curriculum did not significantly increase the mathematics achievement of the incarcerated learners. Those scoring at the 6.0 and above grade levels on reading and arithmetic skills attained the best results. (MNS)

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A Field Test of a Structured Television Curriculum on the Mathematics Achievement of Incarcerated High School Equivalency Learners

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Background of the Study

The individual who completes a secondary school program and is awarded a high school diploma has reached a milestone in the structure of the American educational system. Receipt of this diploma is recognized as evidence that the individual has mastered the skills and knowledge necessary to function as a productive member of society. A problem that has confronted educators for years and continues to exist despite corrective programs is that of the high school dropout. Figures reported by the National Center for Educational Statistics show that 99% of the 5th graders who were in school in 1972 reached the 9th grade, 89% got as far as the 11th grade, but only 74% received a high school diploma in 1980 (National Center for Education Statistics, 1982).

The magnitude of this problem can be fully recognized from the fact that in today's society 25 million American adults can neither read nor write nor handle simple mathematical computations, and an additional 30 to 40 million cannot read or write well enough to understand a complicated warning message or instructions for operating a piece of expensive and complex machinery. The cost of funding welfare programs and loss of productivity has been estimated at six billion dollars annually (Kozol, 1980).

The total costs associated with school drop-outs and iliteracy have long been recognized by those involved with the nation's correctional institutions. Despite the emphasis on decreasing recidivism and prison populations through educational programs, present vocational and academic programs serve fewer than 12% of the total prison population in this country. At the current rate of recidivism approximately 30 to 70% of the 150,000 inmates released this year will be recommited to a correctional facility within a year. Custody costs for these inmates range from $13,000 to $40,000 per year and this does not include court costs, welfare payments and other costs commonly associated with arresting and incarcerating inmates (Department of Education, 1984).

The process of providing educational programs within correctional institutions is complicated by several factors that center on facility environment and serve to fragment the prison day (Gribben, 1983). A possible solution to these problems is the use of television as a teaching resource. The flexibility and cost effectiveness of television has been examined in a wide range of situations and application of the technology to correctional education merits examination.

Purpose of the Study

The purpose of this study was to conduct a field test to determine the effects of a structured television curriculum on the mathematics achievement of high school equivalency learners within a state correctional institution. More specifically, a series of instructional television programs designed and produced to present mathematical concepts measured by the General Educational Development tests were field tested to assess the strengths and weaknesses of the instructional design. The ultimate objective of the study was to determine the effectiveness of the mathematics series on the mathematics achievement of incarcerated high school equivalency learners.

Methodology

The sample was selected from subjects who were members of two intact groups of learners who were enrolled in separate classes and drawn from separate camps within the correctional facility. Subjects were screened for inclusion in the study by administering the Wide Range Achievement Test (WRAT) and including participants who scored at the 5.0 grade level or higher on the arithmetic section of the test. Based this criterion, a total of 49 subjects were included in the sample.

The larger of the intact groups, group one, had 26 participants who met the minimum score criterion and were eligible to be included in the sample. From this group, complete data were obtained from 22 participants (n = 22). The second group of intact subjects, group two, had 23 participants who met the minimum score criteria to be included in the sample. From this group, complete data for the study were obtained from 18 subjects (n = 18). Group one (n = 22) was assigned as the the treatment group and group two (n = 18) served as the control group in the study.

The instruments used in this study were the 1978 edition of the Wide Range Achievement Test (WRAT) and the General Educational Performance Index (GEPI). The GEPI is designed to measure the extent to which adults are ready to attempt the General Educational Development (GED) test and is patterned after the the format of the GED including similar subtests. Form AA of the GEPI was used as a pretest and Form BB was used as the posttest instrument.

The treatment in this study involved the use of the instructional television series, Adult Math, as a reinforcement resource. The series consists of 15, thirty minute television lessons produced by Kentucky Educational Television to help adult learners master mathematical skills

and concepts measured by the GED test. The subjects involved in the study met classes on a 50 minute time period schedule each day for instruction in the content areas. An additional 50 minute time period was included in the schedule and was used for supervised study and reinforcement of content area skills. During each regular 50 minute content area class, subjects in both group one, the treatment group, and group two, the control group, continued to receive traditional instruction. This instruction consisted of individualized assistance in completing self-paced workbooks and instructional materials.

The treatment was implemented during the 50 minute supervised time period allocated for study and reinforcement. Participants in group one, the treatment group, reported for the 50 minute reinforcement period and used television and video tape players to view telelessons from the Adult Math series. Prior to each telelesson the classroom teacher directed the completion of introductory activities in the workbook accompanying the series. Following this activity the subjects viewed the telelessons and returned to the workbooks to complete follow-up activities that reinforced the telelessons.

During this same time period, participants in group two, the control group were assisted by the supervising

teacher in reinforcing their mathematics skills. Materials used during this study period included workbooks and other self-paced materials that provided content instruction parallel to that received by the treatment group.

Analysis of Data

The organizational structure of the correctional institution dictated that the study be conducted using a non-equivalent control group research design. Data analyzed included grade level scores in arithmetic and reading as measured by the Wide Range Achievement Test, pretest scores on mathematics skills as measured by Form AA of the General Educational Performance Index, and posttest scores on mathematics skills as measured by Form BB of the General Educational Performance Index.

The statistical method of analysis of covariance was used to compare the performance of the two groups on the dependent variable of mathematics achievement. According to Kerlinger (1973) this method is appropriate when subjects cannot be matched or assigned at random. The effects of comparing the relationship between pretest scores and posttest scores according to the entry classification using the intervening variables of age, status/classification, length of sentence, and entry grade level scores was

determined by computing Pearson's Product Moment correlations for independent samples. The resulting correlations were tested for significance using Fisher's Z-transformations for independent samples. Ferguson (1971) stated that the significance of difference between two product moment correlation coefficients can be readily tested using Fisher's Z-transformation.

Findings and Conclusions

The primary finding resulting from this study was that the use of the television curriculum as an instructional resource did not significantly increase the mathematics achievement of incarcerated high school equivalency learners. Thus, the research data support the conclusion that the use of television as a reinforcement resource obtains results no different from that of traditional methods of drill and practice using workbooks and supervised study. Chu and Schramm (1967) examined 33 research studies comparing the results between instructional television and conventional teaching with adults and reported that in only 7 of the studies did the use of television result in significant increases in achievement.

Additional findings of the study indicated that the intervening variables of age, classification/status, and

length of sentence were not significant factors in the mathematics achievement resulting from the use of the television curriculum. Thus, the findings of the study support the conclusion that the television curriculum is equally effective with subjects of diverse ages, lengths of sentence, and different classification/status within the correctional institution.

The final findings from the study were that entry grade level scores in arithmetic and reading did make a significant difference in the mathematics achievement resulting from the use of the structured television curriculum. Subjects scoring at the 5.8 grade level and higher on the entry grade level scores of arithmetic and reading did obtain significantly different achievement results than those subjects who scored below the 5.8 grade level on the entry measure. These findings support the conclusion that to obtain the best results the series should be used with subjects scoring at the 6.0 and above grade level on reading and arithmetic skills.

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